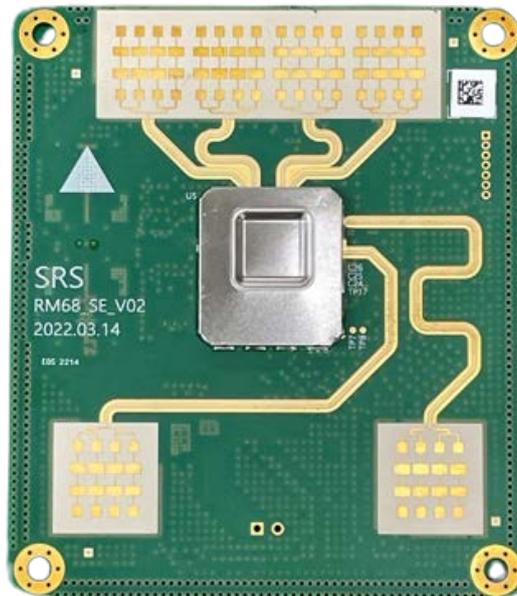


Product Specification: Radar Module (RM68-SE)



| | | |
|--------------------|-----------------------|--|
| Status: Initial | Date: Jul 20, 2023 | Author: Smart Radar System |
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1. Overview

1.1 General Description

The RM68-SE Module from Smart Radar System (SRS) is optimized to detect vehicles on the road and distinguish lanes within a distance of 80m. It has an embedded program on the board that can be configured to meet the various application requirements. It uses TI's integrated single-chip mmWave sensor IWR6843, to support a friendly and easy-to-use FMCW (Frequency Modulated Continuous Wave) radar platform. Unique antenna design technology and algorithms by SRS have enabled the detection of various objects and reliable performance.

Additionally, the TI device includes two ARM R4F-based processor subsystems: one processor subsystem is for master control, and additional algorithms; a second processor subsystem is responsible for front-end configuration, control, and calibration. It can be configured to respond to a variety of application needs by simple programming.

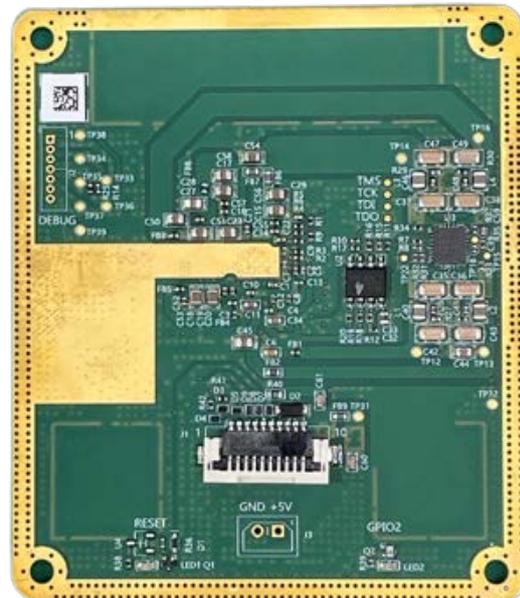
1.2 Features

- FFC interface connector
- Onboard antenna
- A LEDs for basic user interface
- 5V power input.

1.3 Product Appearance



RM68-SE Front



RM68-SE Back

2. Product

2.1 Performance Specifications

(@ 25°C unless otherwise noted)

| Parameters | Spec. | Notes |
|--------------------------|--------------------------|---------------|
| Frequency | 61 ~ 61.5 GHz | |
| Detection Range | Max. 300m | Passenger car |
| Range Resolution | 2.43m | |
| Azimuth Angle (H. FOV) | 20° @20m (±10°) | |
| Azimuth Resolution | 3.1° | |
| Elevation Angle (V. FOV) | 30° | |
| Elevation Resolution | No elevation information | |
| Update rate | 40ms | Configurable |

※ Specifications in this datasheet are subject to change without notice.

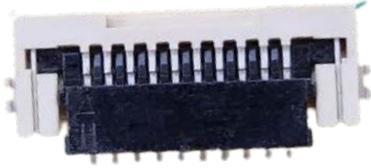
2.2 Operating Conditions

| Parameters | Spec. | Notes |
|-------------------------------|----------------------|-------|
| Main Power Supply | Typ. 5V | |
| Operating Voltage | 4.75 ~ 5.25V | |
| Power Consumption | Ave.:2W, Peak.: 3.5W | |
| Max. Transmitted Power (EIRP) | < 13dBm | |
| Operating Temperature | -40 ~ +85°C | |
| Storage Temperature | -40 ~ +90°C | |

2.3 Connections

10-pin FFC connector

Part Number: 10031HR-H10G / YEONHO



| No | Name | IN/OUT |
|----|-------------|---------------|
| 1 | AR_UART2_RX | Input Signal |
| 2 | AR_UART2_TX | Output Signal |
| 3 | VAR_IO | Input Power |
| 4 | AR_UART1_RX | Input Signal |
| 5 | AR_UART1_TX | Output Signal |
| 6 | AR_RESET_N | Input Signal |
| 7 | GND | GND |
| 8 | GND | GND |
| 9 | VPWR_5V0 | Input Power |
| 10 | VPWR_5V0 | Input Power |

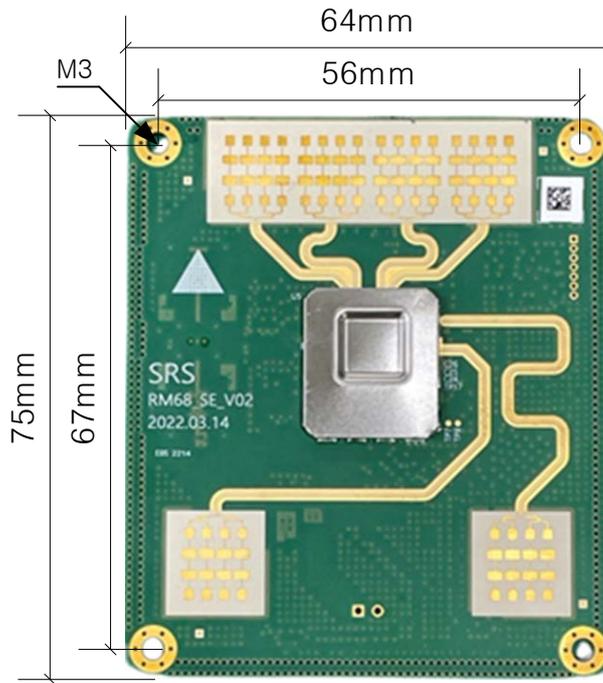
2.4 LEDs

The table below shows the information displayed by the LEDs.

| Ref Num. | Usage | Comments |
|----------|------------------|--|
| LED1 | RESET LED | This LED is used to indicate the state of RESET pin. If this LED is glowing, the device is out of reset. This LED will glow only after the 5-V supply is provided. |
| LED2 | GPIO2 (USER LED) | Glows when the GPIO2 is logic-1. |

2.5 Mechanical Specifications

| Items | Spec. | Notes |
|-----------|----------------------------|------------------------------|
| Dimension | 64 x 75 x 6.6 (PCB t: 1.6) | Module only (W x L x T) (mm) |
| Weight | 22 | Module only (g) |



3. Notice for FCC/IC

FCC Approval

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

FCC Caution: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

This device should be installed and operated with minimum 20cm between the radiator and your body.

IC Approval

This device contains license-exempt transmitter(s)/receiver that comply with Innovation, Science and Economic Development Canada's license-exempt RSS(s). Operation is subject to the following two conditions:(1) This device may not cause interference. (2) This device must accept any interference, including interference that may cause undesired operation of the device.

Cet appareil contient des émetteurs / récepteurs exempts de licence qui sont conformes aux RSS exempts de licence d'Innovation, Sciences et Développement économique Canada. Son fonctionnement est soumis aux deux conditions suivantes:(1) Cet appareil ne doit pas provoquer d'interférences.(2) Cet appareil doit accepter toute interférence, y compris les interférences qui peuvent provoquer un fonctionnement indésirable de l'appareil.

This equipment should be installed and operated with minimum 20 cm between the radiator and your body. Cet appareil doit être installé et utilisé avec un minimum de 20 cm entre le radiateur et votre corps.

INTEGRATION INSTRUCTIONS

List of applicable FCC/ISED rules

This module complies with Part 15.255 of the FCC rule.

This module complies with RSS-210 of ISED rule.

Summarize the specific operational use conditions

15.255(a) Operation under the provisions of this section is not permitted for the following products:

(1) Equipment used on satellites.

(2) Field disturbance sensors, including vehicle radar systems, unless the field disturbance sensors are

employed for fixed operation, or used as short-range devices for interactive motion sensing. For the purposes of this section, the reference to fixed operation includes field disturbance sensors installed in

fixed equipment, even if the sensor itself moves within the equipment.

Per RSS-210 Annex J, the following devices are not permitted:

(a) devices used on satellites

(b) field disturbance sensors, including vehicle radar systems, unless the field disturbance sensors are employed for fixed operation or used as short-range devices for interactive motion sensing (for the purposes of this section, reference to fixed operation includes field disturbance sensors installed in fixed equipment, even if the sensor itself moves within the equipment)

The module is limited to installation in fixed applications only.

Limited module procedures

Not applicable

Trace antenna designs

Not applicable

RF exposure considerations

This module complies with FCC RF radiation exposure limits set forth for an uncontrolled environment. This device should be installed and operated with minimum 20Cm between the radiator and your body.

The host manual shall include the RF exposure statements.

If RF exposure statements and use conditions are not provided, then the host product manufacturer is required to take responsibility of the module through a change in FCC ID (new application).

Antennas

The module itself has antenna.

Label and compliance information

The module is labeled with its own FCC/IC. If the FCC ID/IC is not visible when the module is installed inside another device, then the outside of the device into which the module is installed must also display a label referring to the enclosed module. In that case, the final end product must be labeled in a visible area with the following;

For FCC: "Contains FCC ID: 2AVKZRM68-SE"

For ISCED: "Contains IC: 26970-RM68SE"

The host manual shall include the following regulatory statement:

For FCC:

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

(1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

This device should be installed and operated with minimum 20Cm between the radiator and your body.

For IC:

This device contains license-exempt transmitter(s)/receiver that comply with Innovation, Science and Economic Development Canada's license-exempt RSS(s). Operation is subject to the following two conditions:(1) This device may not cause interference. (2) This device must accept any interference, including interference that may cause undesired operation of the device.

Cet appareil contient des émetteurs / récepteurs exempts de licence qui sont conformes aux RSS exempts de licence d'Innovation, Sciences et Développement économique Canada. Son fonctionnement est soumis aux deux conditions suivantes:(1) Cet appareil ne doit pas provoquer d'interférences.(2) Cet appareil doit accepter toute interférence, y compris les interférences qui peuvent provoquer un fonctionnement indésirable de l'appareil.

This equipment should be installed and operated with minimum 20 cm between the radiator and your body.

Cet appareil doit être installé et utilisé avec un minimum de 20 cm entre le radiateur et votre corps.

Information on test modes and additional testing requirements

Testing of the host product with all the transmitters installed - referred to as the composite investigation test- is recommended, to verify that the host product meets all the applicable FCC rules. The host manufacturer can use the software to control the RF signal during test.

For more information, please contact us.

Additional testing, Part 15 Subpart B disclaimer

The modular transmitter is only FCC authorized for the specific rule parts (i.e., FCC transmitter rules) listed on the grant, and that the host product manufacturer is responsible for compliance to any other FCC rules that apply to the host not covered by the modular transmitter grant of certification.

The host product may need to be evaluated against the FCC Part 15B criteria for unintentional radiators in order to be properly authorized for operation as a Part 15 digital device.